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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,622	01/24/2006	Seung-Woo Lee	6192.0583.US	5616

7590 08/04/2008

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EXAMINER	
LEE JR, KENNETH B	

ART UNIT	PAPER NUMBER
2629	

MAIL DATE	DELIVERY MODE
08/04/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/534,622	LEE ET AL.	
	Examiner	**Art Unit**	
	KENNETH B. LEE JR	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-11 and 13-15* is/are rejected.

7)☒ Claim(s) *5,12 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 May 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-16 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-14 of copending Application No. 10/534623 Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims in current Application No. 10/534622 contain all the limitations of Application No. 10/534623 but are more broad and therefore it would have been obvious to one of ordinary skill in the art at the time when the invention was made to derive the invention of claim 1 of the current application from more narrow claim 1 of the copending application. .

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Application No. 10/534622 Claim 1	Application No. 10/534623 Claim 1
A liquid crystal display comprising: a signal controller including a gamma converter outputting output image data have gamma characteristic adapted to a gamma 2.2 curve based on input image data with a bit number smaller than the output image data	A liquid crystal display comprising: a signal controller including a gamma converter outputting output image data have gamma characteristic adapted to a gamma 2.2 curve based on input image data with a bit number smaller than the output image data
a color correction unit including color coefficients for performing color correction on the image data from the gamma converter	a color correction unit including color coefficients for performing color correction on the image data from the gamma converter
a dithering and FRC processor reducing a bit number of the image data from the color correction unit by taking upper bits of the image data mad controlling position and frequency of the upper bits of the image data	a dithering and FRC processor reducing a bit number of the image data from the color correction unit by taking upper bits of the image data mad controlling position and frequency of the upper bits of the image data
a data driver selecting and outputting gray voltages corresponding to the image data from the signal controller	a data driver selecting the gray voltages from the voltage generator and outputting gray voltages corresponding to the image data from the signal controller
N/A	a voltage generator generating a plurality of gray voltages by dividing a predetermined voltage lower than a supply voltage such that a predetermined one of the gray voltages gives a luminance of about 80 cd/m^2
N/A	an inverter controlling a lamp to emit a luminance higher than 80 cd/m^2

Claim 2	Claim 2

The liquid crystal display of claim 1, wherein the gamma converter comprises an R data modifier, a G data modifier mad a B data modifier for performing the gamma conversion for the input image data for respective red, green and blue colors, and each of the data modifiers maps the input image data into output image data having a gamma characteristic adapted to the gamma 2.2 curve.	The liquid crystal display of claim 1, wherein the gamma converter comprises an R data modifier, a G data modifier mad a B data modifier for performing the gamma conversion for the input image data for respective red, green and blue colors, and each of the data modifiers maps the input image data into output image data having a gamma characteristic adapted to the gamma 2.2 curve.

Claim 3	Claim 3
The liquid crystal display wherein the data modifiers include a nonvolatile memory.	The liquid crystal display wherein the data modifiers include a nonvolatile memory.

Claim 4	Claim 4
The liquid crystal display wherein the color correction coefficients are expressed in a 3x4 color correction matrix.	The liquid crystal display wherein the color correction coefficients are expressed in a 3x4 color correction matrix.

Claim 5	Claim 6
The liquid crystal display wherein the color correction matrix is given by: 0.9535 0.0412 0.0620 2.4168 -0.0717 1.1813 -0.0851 -14.9909 0.0456 - 0.1423 1.1649 -16.0530	The liquid crystal display wherein the color correction matrix is given by: 0.9535 0.0412 0.0620 2.4168 -0.0717 1.1813 -0.0851 -14.9909 0.0456 - 0.1423 1.1649 -16.0530

Claim 6	Claim 7
The liquid crystal display of wherein the gamma converter comprises an R data modifier, a G data	The liquid crystal display of wherein the gamma converter comprises an R data modifier, a G data

modifier and a B data modifier for performing the gamma conversion for the input image data for respective red, green and blue colors, the liquid crystal display further comprises a target image data storage storing a map from the input image data into output image data having a gamma characteristic adapted to the gamma 2.2 curve ,and a controller loading the map stored in the target image data storage into the data modifiers, and the data modifiers select the output image data corresponding to the input image data from the loaded map and outputting the selected output image data.	modifier and a B data modifier for performing the gamma conversion for the input image data for respective red, green and blue colors, the liquid crystal display further comprises a target image data storage storing a map from the input image data into output image data having a gamma characteristic adapted to the gamma 2.2 curve ,and a controller loading the map stored in the target image data storage into the data modifiers, and the data modifiers select the output image data corresponding to the input image data from the loaded map and outputting the selected output image data.

Claim 7	Claim 8
The liquid crystal display wherein the data modifiers comprise a volatile memory and the target image data storage comprises a nonvolatile memory element.	The liquid crystal display wherein the data modifiers comprise a volatile memory, and the target image data storage comprises a nonvolatile memory element.

Claim 8	Claim 9
The liquid crystal display wherein the target image data storage includes a nonvolatile memory in the signal controller and a nonvolatile memory element provided external to the signal controller.	The liquid crystal display wherein the target image data storage includes a nonvolatile memory in the signal controller and a nonvolatile memory element provided external to the signal controller.

Claim 9	Claim 10
The liquid crystal display wherein the gamma converter obtains the output image data from the input image data by way of a mathematical operation.	The liquid crystal display wherein the gamma converter obtains the output image data from the input image data by way of a mathematical operation.

Claim 10	Claim 1
A liquid crystal display comprising: a signal controller including a color correction unit including color coefficients for performing color correction on the image data from the gamma converter	A liquid crystal display comprising: a signal controller including a a color correction unit including color coefficients for performing color correction on the image data from the gamma converter
a data driver selecting and outputting gray voltages corresponding to the image data from the signal controller	a data driver selecting the gray voltages from the voltage generator and outputting gray voltages corresponding to the image data from the signal controller
a voltage generator storing digital gray voltages adapted to conform to a gamma 2.2 curve and converting the digital gray voltages into analog gray voltages to be supplied to the data driver	a voltage generator generating a plurality of gray voltages by dividing a predetermined voltage lower than a supply voltage such that a predetermined one of the gray voltages gives a luminance of about 80 cd/m^2
N/A	an inverter controlling a lamp to emit a luminance higher than 80 cd/m^2

Claim 11	Claim 4
The liquid crystal display wherein the color correction coefficients are expressed in a 3x4 color correction matrix.	The liquid crystal display wherein the color correction coefficients are expressed in a 3x4 color correction matrix.

Claim 12	Claim 6
The liquid crystal display wherein the color correction matrix is given by: 0.9535 0.0412 0.0620 2.4168 -0.0717 1.1813 -0.0851 -14.9909 0.0456 - 0.1423 1.1649 -16.0530	The liquid crystal display wherein the color correction matrix is given by: 0.9535 0.0412 0.0620 2.4168 -0.0717 1.1813 -0.0851 -14.9909 0.0456 - 0.1423 1.1649 -16.0530

Claim 13	Claim 1
A liquid crystal display comprising: a signal controller including a gamma converter outputting	A liquid crystal display comprising: a signal controller including a gamma converter outputting

output image data have gamma characteristic adapted to a gamma 2.2 curve based on input image data with a bit number smaller than the output image data	output image data have gamma characteristic adapted to a gamma 2.2 curve based on input image data with a bit number smaller than the output image data
a color correction unit including color coefficients for performing color correction on the image data from the gamma converter	a color correction unit including color coefficients for performing color correction on the image data from the gamma converter
a dithering and FRC processor reducing a bit number of the image data from the color correction unit by taking upper bits of the image data mad controlling position and frequency of the upper bits of the image data	a dithering and FRC processor reducing a bit number of the image data from the color correction unit by taking upper bits of the image data mad controlling position and frequency of the upper bits of the image data
a data driver selecting and outputting gray voltages corresponding to the image data from the signal controller	a data driver selecting the gray voltages from the voltage generator and outputting gray voltages corresponding to the image data from the signal controller
N/A	a voltage generator generating a plurality of gray voltages by dividing a predetermined voltage lower than a supply voltage such that a predetermined one of the gray voltages gives a luminance of about 80 cd/m^2
An inverter controlling a lamp to emit in a luminance of 80 cd/m^2 for a maximum input image data	an inverter controlling a lamp to emit a luminance higher than 80 cd/m^2

Claim 14	Claim 11
A method of driving a liquid crystal display, the method comprising: converting gamma characteristic of input image data to be adapted to a gamma 2.2 curve	A method of driving a liquid crystal display, the method comprising: converting gamma characteristic of input image data to be adapted to a gamma 2.2 curve
performing color correction on the input image data by applying a color correction matrix for reducing color difference	performing color correction on the input image data by applying a color correction matrix by reducing color difference
controlling luminance of a backlight to be larger than about 80 cd/m^2	controlling luminance of a backlight to be larger than about 80 cd/m^2

N/A	generating a plurality of gray voltages by dividing a predetermined voltage lower than a supply voltage such hat a predetermined one of the gray voltages gives a luminance of about 80 cd/m^2

Claim 15	Claim 12
The method of claim 14, wherein the gamma characteristic conversion includes a mathematical operation realized on an application specific integrated circuit (ASIC).	The method of claim 14, wherein the gamma characteristic conversion includes a mathematical operation realized on an application specific integrated circuit (ASIC).

Claim 16	Claim 14
The liquid crystal display wherein the color correction matrix is given by: 0.9535 0.0412 0.0620 2.4168 -0.0717 1.1813 -0.0851 -14.9909 0.0456 - 0.1423 1.1649 -16.0530	The liquid crystal display wherein the color correction matrix is given by: 0.9535 0.0412 0.0620 2.4168 -0.0717 1.1813 -0.0851 -14.9909 0.0456 - 0.1423 1.1649 -16.0530

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-4, 6-11, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US Patent: 7,030,846) in view of Stokes et al. (US Patent 6,628,828), further in view of Moon et al. (U.S. Patent 6,762,742).

As to claim 1, Lee teaches a liquid crystal display comprising:

a signal controller (100) with a bit number (i.e. 8 bit) smaller than the output image data (i.e. 9 bit), a color correction unit (112, 114, 116) including color coefficients for performing color correction on the image data from the gamma converter, and a dithering and FRC processor (122, 124, 126) reducing a bit number of the image data (9 bit) from the color correction unit by taking upper bits of the image data and controlling position and frequency of the upper bits of the image data (see Fig. 8, Col. 8, Lines 1-44);

a data driver selecting the gray voltages from the voltage generator and outputting gray voltages corresponding to the image data from the signal controller(i.e. data driver is able to output select voltages that are generated at the voltage generator, which include V_{on}, V_{off}, and V_{com}) (see Fig. 7, Col. 7, Lines 33-45);

However, Lee does not explicitly teach including a gamma converter outputting output image data based on input image data have gamma characteristic adapted to a gamma 2.2 curve; such that a predetermined one of the gray voltages gives a luminance of about 80 cd/m^2; an inverter controlling a lamp to emit a luminance higher than 80 cd/m^2.

Stokes teaches including a gamma converter (104) outputting output image data based on input image data have gamma characteristic adapted to a gamma 2.2 curve (see Stokes Col. 7, Lines 20-21); such that a predetermined one of the gray voltages gives a luminance of about 80 cd/m^2; (i.e. in the SRGB standard the 80 cd/m^2 and 2.2

CRT Gamma is officially enumerated as the luminance level, see ITU-R BT.709) (see Stokes, Fig. 3, Col. 7, Lines 12-24).

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to have used the sRGB gamma conversion design of Stoves in the overall signal controller of Lee in order to same computing time and speed up operations. (see Stokes, Col. 1, Lines 45-52).

As to claim 2, Stoke teaches the liquid crystal display of claim 1, wherein the gamma converter comprises an R data modifier, a G data modifier and a B data modifier for performing the gamma conversion for the input image data for respective red, green and blue colors, and each of the data modifiers maps the input image data into output image data having a gamma characteristic adapted to the gamma 2.2 curve (i.e. since the sRGB standard requires the change of gamma to the 2.2 setting, the input data must be change accordingly to fit the gamma 2.2 curve) (see Fig. 3, Col. 6, 1-5).

As to claim 3, Stoke teaches the liquid crystal display of claim 2, wherein the data modifiers include a nonvolatile memory (27) (i.e. the hard disk memory device 27 is nonvolatile memory) (see Fig. 1, Col. 3, Lines 15-16).

As to claim 4, Stokes teaches the liquid crystal display of claim 1, wherein the color correction coefficients are expressed in a 3.times.4 color correction matrix (i.e. since by definition a 5x5 matrix contains numerous 3 x 4 matrix, therefore the color correction coefficients are expressed in a 3 x 4 matrix as well).

As to claim 6, it is analyzed to be broader in scope than claim 1 and is rejected on the same ground.

As to claim 7, see discussion of claim 3 above, claim 7 is analyzed to be broader in scope than claim 3 and is rejected on the same ground.

As to claim 8, Stokes teaches the liquid crystal display of claim 6, wherein the target image data storage includes a nonvolatile memory in the signal controller and a nonvolatile memory element provided external to the signal controller.

As to claim 9, see discussion of claim 1 above, Stokes in view of Moon teaches the liquid crystal display of claim 1, wherein the gamma converter (i.e. the computer realizing the Gamma Correction operation 104) obtains the output image data from the input image data by way of a mathematical operation (i.e. the mathematical operation is applied when the transformation of data carried on a one-dimensional look-up table which requires mathematical operations to access and convert the digital data) (see Fig. 3, Col. 7, Lines 28-51).

As to claim 10, Lee teaches a liquid crystal display comprising:

a signal controller (100) with a bit number (i.e. 8 bit) smaller than the output image data (i.e. 9 bit), a color correction unit (112, 114, 116) including color coefficients for performing color correction on the image data from the gamma converter, and a dithering and FRC processor (122, 124, 126) reducing a bit number of the image data (9 bit) from the color correction unit by taking upper bits of the image data and controlling

position and frequency of the upper bits of the image data (see Fig. 8, Col. 8, Lines 1-44);

a data driver selecting the gray voltages from the voltage generator and outputting gray voltages corresponding to the image data from the signal controller(i.e. data driver is able to output select voltages that are generated at the voltage generator, which include V_{on}, V_{off}, and V_{com}) (see Fig. 7, Col. 7, Lines 33-45);

a voltage generator generating a plurality of gray voltages by dividing a predetermined voltage lower than a supply voltage (i.e. data driver is able to output select voltages that are generated at the voltage generator, which include V_{on}, V_{off}, and V_{com}) (see Fig. 7, Col. 7, Lines 33-45);

As to claim 11, it has limitations similar to those of claim 4 and is rejected on the same grounds.

As to claim 13, Lee discloses a signal controller (100) with a bit number (i.e. 8 bit) smaller than the output image data (i.e. 9 bit), a color correction unit (112, 114, 116) including color coefficients for performing color correction on the image data from the gamma converter, and a dithering and FRC processor (122, 124, 126) reducing a bit number of the image data (9 bit) from the color correction unit by taking upper bits of the image data and controlling position and frequency of the upper bits of the image data (see Fig. 8, Col. 8, Lines 1-44);

a data driver selecting the gray voltages from the voltage generator and outputting gray voltages corresponding to the image data from the signal controller(i.e.

data driver is able to output select voltages that are generated at the voltage generator, which include V_{on}, V_{off}, and V_{com}) (see Fig. 7, Col. 7, Lines 33-45);

Moon teaches an inverter (62) controlling a lamp (64) to emit a luminance (i.e. the inverter control modifies the output of the lamp depend on the V_{duty} input) (see Fig. 11, Col. 13, Lines 10-30).

As to claim 14, it is a method of claim 1 and is rejected on the same grounds.

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view Stokes, further in view of Moon as applied to claim 1-11, 13-14 above, and further in view of Brown Elliot et al. (US Patent: 7,221,381).

As to claim 15, Stokes teaches the method of claim 11, wherein the gamma characteristic conversion (i.e. step 104) includes a mathematical operation but does not explicitly teaches realized on an application specific integrated circuit (ASIC). Brown Elliot teaches gamma characteristic conversion realized on an application specific integrated circuit (ASIC) (i.e. performing pre-conditioning Gamma prior to rendering using ASIC) (see Brown Elliot, Fig. 52A, Col. 40, Lines 57-65).

Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to have used the ASIC circuitry of Brown-Elliot inside the computer system of Stokes in order to allow precise control of gamma to provide high quality images (see Brown-Elliot, Col. 4, Lines 1-2).

Allowable Subject Matter

6. Claim 5, 12, and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: None of the prior art either singularly or in combination teaches the color correction matrix with the given specific row and column numbers indicated by the applicant.

8.. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Stokes et al. "A standard Default Color Space for the Internet – sRGB" is cited to disclose the sRGB format. Lee et al. (US Pub: 2006/0208983) is cited to teach an almost identical application having different claim scope.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KENNETH B. LEE JR whose telephone number is (571)270-3147. The examiner can normally be reached on Mon. - Fri. 7:30AM - 4:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexander Eisen can be reached on 571-272-7687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kenneth B. Lee Jr.
Examiner
Art Unit 2629

KBL

/Alexander Eisen/
Supervisory Patent Examiner, Art Unit 2629